

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 03 MAY 2006

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Applicant's or agent's file reference PCT/ZA2004/000157		FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/ZA2004/000157		International filing date (day/month/year) 17.12.2004	Priority date (day/month/year) 19.12.2003	
International Patent Classification (IPC) or national classification and IPC INV. C10L1/08 C10L10/02				
Applicant SASOL TECHNOLOGY (PTY) LTD et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 8 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand 30.05.2005		Date of completion of this report 02.05.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized officer Bertrand, S Telephone No. +49 89 2399-7861		



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/ZA2004/000157

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-12 as originally filed

Claims, Numbers

1-22 filed with telefax on 19.09.2005

Drawings, Sheets

1/1 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing *(specify):*
 - ☐ any table(s) related to sequence listing *(specify):*
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing *(specify):*
 - ☐ any table(s) related to sequence listing *(specify):*

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application,
☒ claims Nos. 20-22

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 20-22 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☐ no international search report has been established for the said claims Nos.
- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
- | | |
|----------------------------|--|
| the written form | <input type="checkbox"/> has not been furnished |
| | <input type="checkbox"/> does not comply with the standard |
| the computer readable form | <input type="checkbox"/> has not been furnished |
| | <input type="checkbox"/> does not comply with the standard |
- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
- ☐ See separate sheet for further details

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/ZA2004/000157

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	14
	No: Claims	1-13,15-19
Inventive step (IS)	Yes: Claims	
	No: Claims	1-19
Industrial applicability (IA)	Yes: Claims	1-19
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Claims 20-22 contain references to the description and the drawing. According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here. Thus no opinion has been established for the subject-matter of claims 20-22.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents cited in the International Search Report:

D1: TANAKA SHIGEYUKI ET AL: "Two-stage ignition in HCCI combustion and HCCI control by fuels and additives" COMBUSTION AND FLAME, vol. 132, no. 1-2, 1 January 2003 (2003-01-01), pages 219-239, XP002326337

D2: WO 00/60029 A

D3: US 2003/052041 A1

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-13, 15-19 is not new in the sense of Article 33(2) PCT.

2.1 Clarification of the scope of the claims:

Independent claim 1 is drafted as a claim to a composition for a particular use and should be construed as meaning a composition which is in fact suitable for the stated use; a known product which prima facie is the same as the substance or composition defined in the claim, but which is in a form which would render it unsuitable for the stated use, would not deprive the claim of novelty, but if the

known product is in a form in which it is in fact suitable for the stated use, though it has never been described for that use, it would deprive the claim of novelty.

Furthermore the subject-matter of claims 1, 3 and 4 is defined with parameters. It may happen that in the relevant prior art a different parameter, or no parameter at all, is mentioned. If the known and the claimed products are identical in all other respects or if other methods are used to measure the parameter, then in the first place an objection of lack of novelty arises.

The terms "negligible", "in the order of" and "substantially" used in claims 2, 9 and 13 have vague and leave the reader in doubt as to the meaning of the technical features to which they refer, thereby rendering the definition of the subject-matter of said claims unclear, Article 6 PCT.

The statement, "fuel component having from 7 to 14 carbon atoms by removing" found in claim 16 is incomplete and therefore not clear (Article 6 PCT).

- 2.2 D1 (p.231, 233, 238) discloses n-heptane and iso-octane mixtures having ignition delay between 2 and 4 ms, resulting in lack of novelty of the subject-matter of claims 1-13, 15 for the reasons indicated in point 2.1.

D1 does not disclose a distillation range from 90°C to 270°C and does not disclose any process comprising the steps indicated in present claim 16. Consequently the subject-matter of claims 14, 16-19 is novel over D1.

D2 (see the relevant passages cited in the ISR) relates to a process for the production of a synthetic naphtha fuel suitable for use in compression ignition (CI) engines, the process including at least the steps of hydrotreating at least a fraction of a Fischer-Tropsch (FT) synthesis reaction product of CO and H₂, or a derivative thereof, hydrocracking at least a fraction of the FT synthesis product or a derivative thereof, and fractionating the process products to obtain a desired synthetic naphtha fuel characteristic. Table 5 discloses compositions which are blends of n-paraffins and isoparaffins. The distillation range indicated shows that the blends comprise paraffins with 7, 8 or 9 carbons atoms. According D1, the compositions are believed to have an ignition delay of less than 7 ms. Thus D2 is prejudicial to the novelty of the subject-matter of claims 1-13, 15-19.

D2 does not disclose a distillation range from 90°C to 270°C.
Consequently the subject-matter of claim 14 is novel over D1.

D3 (see the relevant passages cited in the ISR) discloses a fuel for a homogeneous charge compression ignition engine having a 95 vol.% distilled temperature by boiling point measurement in the range of about 35 DEG C. to about 350 DEG C., a cetane number in the range of about 2 to about 120, and an octane number in the range of 10 to about 110.

D3 does not disclose a fuel composition having an ignition delay of less than 7 ms and which includes at least n-paraffins and isoparaffins having from 7 to 14 carbon atoms and does not disclose any process comprising the steps indicated in independent claim 16. Consequently the subject-matter of independent claims 1 and 16 and dependent claims 2-15 and 17-19 is novel over D3.

3. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 14 does not involve an inventive step in the sense of Article 33(3) PCT.

D3 (see the relevant passages cited in the ISR) is regarded as being the closest prior art to the subject-matter of claim 14 and discloses a fuel for a homogeneous charge compression ignition engine having a 95 vol.% distilled temperature by boiling point measurement in the range of about 35 DEG C. to about 350 DEG C., a cetane number in the range of about 2 to about 120, and an octane number in the range of 10 to about 110.

The subject-matter of claim 14 therefore differs from the teaching of D3 in that D3 does not disclose a composition having an ignition delay of less than 7 ms and having a distillation range from 90°C to 270 °C.

The problem to be solved by the present invention may therefore be regarded as the provision of an alternative fuel which may be used according to the homogeneous charge compression ignition mode. This has been solved by the subject-matter of claim 14. However the solution proposed does not involve an inventive step for the following reason:

Faced with the problem to be solved, the skilled person would have considered the teaching of D3.

D3 mentions that "the fuel can have an ignition delay sufficiently long that the onset of combustion shall be achieved by the engine fuel after the moving piston has exceeded the point of maximum mechanical compression in the movement cycle. Further, the engine fuel may have an ignitability sufficiently high that uniform continuous combustion is achieved throughout the fuel-air charge filling the piston cylinder once ignition commences", see paragraph 30. Considering this point, the skilled person would have also considered D1 to determine the optimal ignition delay. D1 teaches that fuel comprising hydrocarbon mixtures having ignition delay between 2 and 4 ms are suitable fuel for HCCI engines. Therefore he would select a fuel having these characteristics to solve the problem.

Furthermore considering the distillation range, the skilled person in the art would have chosen a distillation range comprised in the distillation range indicated in D3. Such a selection can only be regarded as inventive, if the selection presents unexpected effects or properties in relation to the rest of the range. However, no such effects or properties are indicated in the application. Hence, no inventive step is present in the subject-matter of claim 14.

Re Item VIII

Certain observations on the international application

See point 2.1.